

SUMMARY

The present invention offers the in - situ testing apparatus which is aimed at evaluating the liquefaction and dynamic characteristics of soils using bore - holes by conducting the cyclic loading tests on a given soil layer.

The monitoring zonde is composed of three cells. The cyclic loading is applied alternatively to the top and bottom soil layers of J1 and J3, and the pressure and displacement at the central layer J2 are monitored and examined whether there is any effect of the cyclic loading imposed on the top and bottom soil layers on the response of the central soil layer J2.

The testing procedure is as follows. The cyclic loading is applied until the failure occurs, and the failure strength is observed. The occurrence of liquefaction is also examined.

In the case where the failure does not occur, the static loading is applied after the cyclic loading application, and the basic response (deformation and strength characteristics) is observed.

The monitoring zonde is composed of five cells. The soil layer J4 above the top soil layer J1 and the soil layer J5 beneath the bottom soil layer J3 are also preferably statically loaded in a manner similar to the central soil layer J2.

By applying the static loading to the top and bottom soil layers of J4 and J5, the collapse of the top and bottom soil layers, J1 and J2, can be prevented. In addition, the stable application of cyclic loading on the top and bottom soil layers becomes possible. It is also possible to monitor the pressures and displacements at the soil layers, J4 and J5, during the cyclic loading, and to examine the basic response of soils by comparing the data of the soil layers of J4 and J5 with those of the central soil layer.